



SMITHSONIAN INSTITUTION
U. S. NATIONAL MUSEUM

Vol. 97

Washington: 1947

No. 3215

A SYNOPSIS OF THE LARVAEVORID FLIES OF THE GENUS EUDEJEANIA ¹

By CURTIS W. SABROSKY

THE large and heavily spined flies of the tribe Dejeaniini, which reach their greatest development in the Andean mountains, have always attracted the attention of students of the Diptera. In an attempt to identify a number of specimens from Colombia, it proved so extremely difficult to name and to decide upon the status to be accorded the various forms of *Eudejeania* Townsend that a study was undertaken of the rather considerable material at hand. In the interpretation of older descriptions, it is necessary for the most part to use color distinctions, but I am convinced from a study of the available material that certain of these may be relied upon in this group.

Genus EUDEJEANIA Townsend

Eudejeania TOWNSEND, Proc. U. S. Nat. Mus., vol. 43, p. 334, 1912. Two species; type by original designation, *E. subalpina* Townsend.

Eudejeania, *sensu lato*, ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, pp. 277-292, 1920.

Key to seven species and four varieties; genotype cited as *E. pallida* (Robineau-Desvoidy), with *subalpina*, a variety.

Eudejeania TOWNSEND, Rev. Ent., vol. 1, p. 163, 1931. Discussion of the genotype and the Mexican and Central American species.

Eudejeania TOWNSEND, Manual of myiology, pt. 8, pp. 78-79, 1939. Generic diagnosis; said to range in many species from Mexico to Bolivia, at high elevations.

¹The material upon which this study was based is contained in the collection of the U. S. National Museum and in an interesting collection of flies kindly submitted for determination by Hernando Osorno Mesa, Instituto de Ciencias Naturales, Ciudad Universitaria, Bogotá, Colombia.

Eudejeaniops BLANCHARD, La Plata Mus. Rev., new ser., vol. 2, pp. 353-357, 1941.
Four species, two of them new; type by original designation, *Eudejeaniops pseudopyrrhopoda* Blanchard. New synonym (?).

The genus was erected by Townsend (1912) for two new species from Peru, *E. subalpina* and *E. nigra*, the former being designated as genotype. Engel (1920) revised the genus, listed a number of species, and presented a key to seven species and four varieties, some of which are now referred to other genera. In 1941 Blanchard proposed the name *Eudejeaniops* for two new species plus *E. pallipes* (Macquart) and *E. pyrrhopoda* (Engel), distinguishing his genus from *Eudejeania* mainly by the presence in the former of proclinate frontoorbital bristles in the female.

The presence or absence of these bristles was often used by Townsend as an important generic character. Townsend's conception of *Eudejeania* (1939, p. 78) was that neither sex possessed these bristles, which was true of the species that he designated as genotype (*subalpina*) but not of the second species originally included (*nigra*). He stated also that the genus ranged in many species from Mexico to Bolivia, and he indicated that his concept included Engel's several forms of *pallipes*. In reality, however, all the latter have proclinate frontoorbitals in the female sex. In fact, of all the species considered in this study only *subalpina* lacks them.

It is readily apparent from available material that the character is rather variable in this particular group. In a sample series of 25 females of one species (*aldrichi*) from Bogotá, 16 had two pairs of frontoorbitals, 3 had one pair, and 6 were asymmetrical (1 on one side and 2 on the other, in one individual with 3 and 2). Two males were found with a fully developed bristle on one side, and one male with a complete pair of bristles. Similar variation has also been observed in the other species. In view of the considerable variation exhibited in the abundant material before me, therefore, I do not accept the character by itself as a criterion of generic value. In the key (p. 153) the use of the character has been avoided except as a last resort in one instance.

Curran² distinguished *Eudejeania* from *Dejeania* by the lack of acrostichal bristles in the former, though Townsend (1939, p. 78) stated that one pair of presutural acrostichals was a generic character for *Eudejeania*. Actually the number of both acrostichal and dorsocentral bristles is highly variable in this particular genus and cannot be relied upon. Detailed notes on this will be found under *E. aldrichi*.

The species of *Eudejeania* are remarkably similar in structure and habitus, and it seems unnecessary to describe the species here in the

²Families and genera of North American Diptera, p. 423, couplet 24, 1934.

detail usually associated with descriptions of Larvaevoridae. Except for the points in which variation has been noted, the generic diagnosis of Townsend (1939, p. 78) will apply to all the species herein considered in *Eudejeania*. Along with other structures, the male genitalia are rather uniform throughout the genus. Some differences have been observed, especially in the shape and proportion of the fused anal forceps, but they are of a comparative nature and are not so readily defined as the characters that have been employed in this study. Insofar as differences can be observed, they corroborate the status of the species recognized here.

A diagnostic key to the species of the genus follows the systematic discussion of the valid species of the genus (p. 153).

1. EUDEJEANIA NIGRA Townsend

Eudejeania nigra TOWNSEND, Proc. U. S. Nat. Mus., vol. 43, p. 335, 1912 (Peru, 7,800 feet).

Eudejeania alpina TOWNSEND, Psyche, vol. 20, p. 106, 1913 (Peru, 12,000 feet).
New synonym.

I have compared the types of the two species in the collection of the United States National Museum, but I am unable to find any differences to justify regarding them as distinct. It is possible, of course, in view of the considerable difference in elevation involved, that were long series of specimens available one might find some consistent even if minor differences. At present I can recognize no such differences. The essential characteristics are as follows:

Body entirely black or dark brown-black; parafacials, cheeks, and occiput yellowish to smoky golden, the occipital hairs yellow; width of front in the male equals 0.36 the width of the head; palpi orange-yellow; third antennal segment black, the basal segments brown, narrowly orange about the juncture of the second and third; wings heavily browned; subepaulet (basicostal scale) brownish yellow to orange; legs entirely reddish yellow, the bristles and hairs of all tibiae and tarsi the same; dorsal (extensor) surface of the hind tibia, between the anterodorsal and posterodorsal rows, glabrous except for a few pale hairs at the extreme base; hind tibia with a row of 8-10 anterodorsal bristles of varying lengths; large species, averaging 16-17 mm. in body length.

Townsend described *E. alpina* as having entirely black antennae, but the type and paratype actually have the second antennal segment reddish on the distal fourth. The character is not significant, and it is mentioned only because it might be pointed out from the description alone as an apparent difference.

Besides the two type series (♂, 2 ♀ of *nigra*, 2 ♀ of *alpina*), there are four specimens in the National Museum collection that seem to be-

long here. They were labeled by Townsend as a variety of *E. punensis*, but their name was never published. All are from Peru: Female, Cuzco, 11,500 feet, July 4, 1911 (Yale Peruvian Exped.); three females, Matucana, 8,000 feet, May 1, 1914, August 1 and August 16, 1913 (C. H. T. Townsend).

2. EUDEJEANIA PUNENSIS Townsend

Eudejeania punensis TOWNSEND, Psyche, vol. 20, p. 105, 1913 (Peru, 12,000 feet).

This species was based on a long series of specimens, of which the holotype, 30 paratypes, and 5 topotypical specimens that may have been paratypes but are not so labeled are in the collection before me. There is only one male in the entire series (one of the topotypes).

The species is easily distinguished from the other species of *Eudejeania*, except *pallipes*, by its consistently smaller size and from all the known species by the yellowish appearance of the wings, especially toward the base. In reality, the wing membrane is entirely brown as in the other species and is only slightly paler than the others, but the veins are decidedly yellow. On the basal third of the wing, where the veins converge and are stronger, the result is a conspicuous yellow appearance contrasting strongly with the deep black of the body. Further, the species may be characterized as follows:

Body entirely black or dark brown-black; parafacials, cheeks, face, and epistoma yellow; occiput yellow to dark gray, with yellow hairs; width of the front at the vertex in the male equal to 0.34 the width of the head; palpi bright orange-yellow; first and second antennal segments bright reddish yellow, the third black except narrowly at the base; subepaulet orange to brown; legs entirely reddish yellow, the bristles and hairs of the tibiae and tarsi concolorous; bristles and hairs of the hind tibia almost as described for *E. nigra*, but the extensor surface sometimes with pale hairs on the proximal half; smaller species, the body length consistently about 14 mm.

3. EUDEJEANIA PYRRHOPODA Engel

Eudejeania pallipes var. *pyrrhopoda* ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, pp. 281, 287-289, 1920 (Peru, Colombia, Bolivia).

Eudejeaniops pyrrhopoda (Engel) BLANCHARD, La Plata Mus. Rev., new ser., vol. 2, p. 353, 1941.

Engel credited the name to Schiner, using a manuscript name, but it was never published by the latter. The author is therefore cited as Engel.

It seems evident from Engel's statements on the color of the legs and their bristles, and from the consistency of those characters in the material I have seen, that Engel had at least two species under the name *pyrrhopoda*. I propose to restrict the application of the name to

that species with reddish-yellow legs and black tibial bristles which he regarded as the typical form. His material with these characteristics came from Madre de Dios and Urubamba, Peru [Mus. Dresden]. It is not clear from his notes whether the Bolivian specimens also belong.

I have seen no material which can be identified as *pyrrhopoda* Engel, *sensu stricto*, and further elucidation of the status of this species must await a reexamination of Engel's original specimens, if still in existence, and also an adequate series of Peruvian examples.

It is possible that *E. birabeni* Blanchard (1941) is a synonym (cf. discussion under *birabeni*).

EUDEJEANIA BIRABENI (Blanchard), new combination

Eudejeaniops birabeni BLANCHARD, La Plata Mus. Rev., new ser., vol. 2, p. 355, fig. 9, 1941 (Argentina).

According to the description *E. birabeni* is a species with black body, black palpi, black femora, and reddish-yellow tibiae and tarsi, the tibiae with reddish-yellow hair but black bristles. As far as I can tell from the description this species is near *E. pyrrhopoda* Engel, as the latter is restricted to the form with reddish-yellow legs and black tibial bristles. Engel's specimens came from Peru and possibly also from Bolivia. Whether the Argentine form is distinct or only a synonym will have to await study of adequate material from the Peru-Bolivia-Argentina region.

4. EUDEJEANIA HUASCARAYANA Townsend

Eudejeania huascarayana TOWNSEND, Insecutor Inscitiae Menstruus, vol. 2, p. 171, 1914 (Peru).

The only specimen that I have seen is the male holotype in the United States National Museum. It is very close to *E. nigra*, differing chiefly in its blackish palpi and narrower front.

Body entirely black, the abdomen with a faint reddish tint; parafacials, cheeks, and occiput golden-yellow, the last with bright yellow hair; epistoma brown; width of the male front at the vertex equal to 0.28 the width of the head, and obviously narrower than in the other species; palpi dark brown-black; antennae entirely black with only narrow reddish margins at the juncture of the second and third segments; subepaulet brown; legs entirely reddish-yellow, the tarsi brighter; tibial and tarsal bristles and hairs reddish-yellow; hind tibia with a row of anterodorsal bristles of varying lengths (broken in the type, but apparently 8–10 as in related species); dorsal surface of the hind tibia apparently with several rows of hairs on the basal half; large species, the body length 17 mm.

5. EUDEJEANIA SUBALPINA Townsend

Eudejeania subalpina TOWNSEND, Proc. U. S. Nat. Mus., vol. 43, p. 334, 1912 (Perú, 11,500 feet); Rev. Ent., vol. 1, p. 163, 1931. Genotype, by original designation.

Eudejeania pallida var. *subalpina* (Townsend) ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, p. 291, 1920.

Body color reddish brown or deep blood red, the disk of the mesonotum centrally brown; parafacials, face, and cheeks light brown, only the facial ridges and a narrow portion of the parafacials near the eyes grayish; occiput grayish yellow, the hairs yellow; width of the male front at the vertex approximately one-third the width of the head (0.33 and 0.36 in two specimens available); female holotype without proclinate frontoorbital bristles; palpi deep black; antennae black, only the second segment tipped with yellow at the apex above; subepaulet orange; legs entirely reddish yellow, tibial and tarsal bristles and hairs the same; hind tibia with a row of 8–10 anterodorsal bristles of varying lengths; dorsal surface of the hind tibia not entirely glabrous, with 1 or 2 irregular rows for at least part of the length; large species, the body length 17–18 mm.

I do not believe that *subalpina* is a variety of *pallida* Robineau-Desvoidy, at least in the sense of Engel (1920). Engel stated that the "typical" form of *pallida* had the tibiae covered with appressed, silvery-white hairs, which would place *pallida* (of Engel!) in an entirely different group of species than *subalpina* Townsend (cf. discussion under *E. pallida*).

Besides the female holotype and a male paratype, both in the National Museum, I have seen only one other specimen of *subalpina*, a male from "Cuesta von Cillutincara," Bolivia, 3,000–3,200 m. (Fassl), determined by Engel himself as *Dejeania pallida* Robineau-Desvoidy and undoubtedly one of the specimens of the same data recorded by Engel (1920, p. 292) as "*pallida* var. *subalpina*." Townsend stated that his two original specimens were males, but the one labeled "type" in the Museum collection is a female.

6. EUDEJEANIA ALDRICHI, new species

Species with bright reddish-yellow legs that contrast vividly with the dark body.

Male, female.—Typical habitus and structure of *Eudejeania*, specifically characterized as follows:

Head dark above, the frontal stripe black and the parafrontals dark brown, the remainder of the head smoky golden to brown; epistoma brown; occipital hair yellow, the long hairs below reddish yellow; palpi black to dark brown; antennae black, the second segment narrowly reddish at the apex, the third segment of the male not broadened

basally; width of the front at the vertex in the male 0.38 times the width of the head (average of 10 males, Bogotá; range, 0.35–0.39); female with 1 or 2 pairs of proclinate frontoorbital bristles, apparently typically two (cf. introductory discussion for note on variation).

Body color to the naked eye as dark as the black species, but under a microscope the abdomen is dark reddish brown, sometimes with a trace of a narrow median black vitta; acrostichal and dorsocentral bristles variable in number (cf. discussion that follows).

Wing membrane and veins brown; subepaulet (basicosta) orange-yellow.

Legs entirely bright reddish yellow, the tibial and tarsal bristles and hairs concolorous, rarely an isolated tibial bristle black; tarsal claws reddish yellow with black tips; hind tibia with a row of 8–10 anterodorsal bristles of varying lengths; tibial hairs short and not so dense as in some of the other species, the ground color of the tibia readily apparent; dorsal (extensor) surface of the hind tibia glabrous except for a few yellow hairs near the base.

Length of the body typically about 16 mm., with a few specimens as small as 13 mm.

Type.—Male, U.S.N.M. No. 58279.

Holotype, male, and allotype, Bogotá, Colombia (B. Guevara), in the United States National Museum. Paratypes: COLOMBIA: 62 males, 115 females, same data as holotype [U.S.N.M.]; female, Usaquén, Cundinamarca, September 30, 1939, alt. 2,700–3,000 m. (H. Osorno); male, *ibid.*, June 9, 1939, same alt. (L. Richter); male, *ibid.*, June 19, 1941, alt. 2,850 m. (L. Richter); male, Páramo Guerrero (Zipaquirá-Pacho), Cundinamarca, September 26, 1940, alt. 3,080 m. (H. Osorno) [Inst. Cien. Nat., Bogotá]. ECUADOR: male, Quito, 2,850 m.; male, 2 females, Aloag, 2,922 m. (F. Campos R.) [U.S.N.M.].

The species is named in honor of the late John Merton Aldrich, for many years curator of insects of the United States National Museum.

This species is superficially quite similar to *E. huascarayana* Townsend, but the latter has a black abdomen and the front of the male is noticeably narrower. The legs appear more strikingly reddish yellow in *aldrichi*, but of course this is a comparative matter that is difficult to grasp except by direct comparison of specimens.

The availability of the fine series of this species from one locality (Bogotá) made it possible to study the variation in certain characteristics that have usually been regarded as significant. For this purpose, a sample of 50 specimens, 25 of each sex, was tabulated.

It was at once apparent that these flies exhibit a considerable degree of variation in chaetotaxy, even in characters that have been regarded as of generic significance. This was particularly true in the acrostichal and dorsocentral bristles. If we may judge from predominance

in the present sample, the regular formula seems to be: acrostichals, 1+0 (one pair of presuturals plus none of postsuturals), and dorsocentrals 2+1. In reality, only 10 specimens (20 percent of the sample) possessed this combination. The following list gives the observed formulae for each type of bristle, though it is obvious that there would be a number of different cross combinations of the acrostichal and dorsocentral formulae:

Acrostichals	Dorsocentrals
1 + 0, 22 specimens	1 + 1, 6 specimens
0 + 0, 18 specimens	2 + 1, 21 specimens
1 + 1, 1 specimen	3 + 1, 9 specimens
asym. ³ + 0, 7 specimens	2 + 2, 2 specimens
asym. ³ + 1, 2 specimens	3 + 2, 2 specimens
—	asym. ³ 10 specimens
50 specimens	—
	50 specimens

The actual variation was even greater than these figures indicate. Even where the number of bristles was the same on both right and left sides, those present were not always in homologous positions. What is recorded as one pair of presutural dorsocentrals may really be composed on the right side of a bristle in the forward position near the head and on the left of a bristle adjacent to the transverse suture. With such variation there are numerous possible combinations, and many of these were found in the analysis of the sample series.

The characters that have been used in this paper for specific diagnosis were found to be constant in the series or varied only within narrow limits. Although lack of adequate material in most of the other species made a similar detailed treatment impossible, observations on the available specimens indicate that the situation in *aldrichi* is probably typical for this group of flies.

7. EUDEJEANIA ARGYROPOUS (Schiner)

Dejeania argyropus SCHINER, Reise Novara, Diptera, p. 337, 1868.

Eudejeania pallipes var. *argyropus* (Schiner) ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, p. 281, 288, 1920.

Eudejeania argyropus is one form upon which there has been general agreement. It is the only species I have seen with the combination of entirely black legs, silvery hairs covering the tibiae and tarsi, and the parafacials smoky golden ("goldbraun" of Schiner).

Body color deep black; parafacials, cheeks, and occiput smoky golden, the occipital hairs yellow except on the lower third; palpi deep black; antennae entirely black; subepaulet orange-yellow; legs entirely

³ Asymmetrical, the number of bristles not the same on left and right sides of the same individual. This was observed in the presutural acrostichals and in both presutural and postsutural dorsocentrals.

black in ground color, the tibiae and tarsi densely covered with silvery hairs; tibial bristles black; hind tibia with two strong anterodorsal bristles, and sometimes a weak third basad of them; dorsal surface of the hind tibia thickly covered with hairs on its entire length.

Material examined, 8 specimens: COLOMBIA: 2 males, 1 female, Monserrate, Bogotá, May 2, 1940, alt. 2,700–3,000 m. (H. Osorno) [Inst. Cien. Nat.]; male, 3 females, Bogotá (B. Guevara) [U.S.N.M.] ECUADOR: Male, Aloag (F. Campos R.) [U.S.N.M.].

8. EUDEJEANIA PALLIPES (Macquart)

Dejeania pallipes MACQUART, Diptères exotiques . . . , vol. 2, pt. 3, p. 191, pl. 2, fig. 9, 1843; suppl. 1, p. 371, 1846 (pagination of Mem. Soc. Roy. Lille; pp. 34 and 143, respectively, in the separate work.)

Eudejeania pallipes (Macquart) ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, pp. 281, 287–289, 1920.

Eudejeania pallipes (Macquart) TOWNSEND, Manual of myiology, pt. 8, p. 79, 1939.

Engel considered *pallipes*, *sensu stricto*, to be a form with whitish-yellow tarsi, tibiae gray black in ground color but covered with silvery hairs, and brown-black femora. In the light of present knowledge of variation in the group, Macquart's brief description ("Pieds d'un jaune pâle; cuisses antérieures testacées") shows that Engel quite probably misidentified the species.

Macquart's type came from Bogotá, and we are fortunate in having in the National Museum collection a long and unusually fine series of specimens of *Eudejeania* from that vicinity. Two species are present in numbers, presumably being common there, and either of these might have been the original of Macquart's species. One species, labeled *pallipes* by Aldrich, has orange tibiae with black bristles and orange to brownish femora. This is apparently the form determined as *pallipes* by Van der Wulp,⁴ who also had material from Bogotá in addition to specimens from Costa Rica and Panama. The other species has entirely reddish-yellow legs with bristles and hairs of the same color. The latter might have been *pallipes* of Macquart, but since the type of the species was long since lost and that point can never be determined I believe it best to continue the Van der Wulp and Aldrich identification of the species.

Engel recognized only one species of the black form with black palpi, namely *E. pallipes* (Macquart), and considered *melanax* as a synonym and *argyropus* and *pyrrhopoda* as varieties. Townsend (1939, p. 79), on the other hand, expressed the opinion that these "varieties" of Engel "are no doubt valid species, which interbreed at times to produce hybrids with intermediate characters." The present study corroborates Townsend's view that several distinct species are involved.

⁴ *Biologia Centrali-Americana, Diptera*, vol. 2, p. 8, 1888.

The species which I recognize as *pallipes* Macquart (= *pallipes* of Van der Wulp and Aldrich, not of Engel) is characterized as follows:

Body color black; parafacials and cheeks smoky golden to brown; occiput and occipital hairs dark gray-yellow; palpi black; antennae black to dark brown, the second segment narrowly reddish apically; subepaulet orange-yellow; legs predominantly yellow, the tarsi whitish yellow, tibiae yellow to orange, the femora deep orange becoming fuscous toward the base; tibial bristles black; hind tibia typically with three anterodorsal bristles, the basal one weak and sometimes not evident; tibial and tarsal hairs silvery white, but the tibiae less thickly covered than in *argyropus* and others, and ground color readily evident; dorsal surface of the hind tibia with two rows of silvery hairs.

Material examined, 89 specimens: COLOMBIA: 16 males, 67 females, Bogotá (B. Guevara) [U.S.N.M.]; male, 2 females, Monserrate, Bogotá, 2,700–3,000 m., May 2, 1940 (♂), and August 7, 1939 (H. Osorno); 2 females, Usaquén, Cundinamarca, 2,700–3,000 m., October 3, 1939 (H. Osorno) [Inst. Cien. Nat.]; female, above Guasca, Cundinamarca, 3,300 m., February 20, 1942 (E. A. Chapin) [U.S.N.M.].

9. EUDEJEANIA MELANAX (Walker)

Tachina melanax WALKER, List of the dipterous insects in the British Museum, pt. 4, p. 700, 1849 (Venezuela).

Dejeania podiceria RONDANI, Arch. Zool. Modena, vol. 3, No. 1, p. 17, pl. 5, fig. 14, 1864. New synonym.

Dejeania melanax (Walker) AUSTEN, Ann. Mag. Nat. Hist., ser. 7, vol. 19, p. 327, 1907. Gen. ref. from the type.

Eudejeania pallipes (Macquart) ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, p. 287, 1920. *E. melanax* in synonymy, "teste Austen."

The essential characters of *E. melanax* are as follows: Body color black; parafacials and cheeks silvery white except for a small triangular area posterior to the vibrissa; occiput silvery white, the hairs white; palpi black; antennae black, the second segment obscurely reddish at the apex; males with subpyriform third antennal segment, about 1.7 times as broad at the base as at the apex; subepaulet brown to black; femora and tibiae entirely black, the tarsi more or less infuscated apically, at least the metatarsi yellow, in extreme cases only the distal tarsal segment infuscated above; tibiae and tarsi densely covered with silvery white appressed hairs; tibial bristles black; hind tibia typically with three anterodorsal bristles, the basal one weak; dorsal surface of the hind tibia densely covered with hairs on its entire length.

The strongly developed third antennal segment mentioned by Walker is characteristic only of the males, though the females have the segment slightly more expanded than in some of the other species of the genus. The females can be distinguished from those of *argy-*

ropus, which they resemble, by the yellow metatarsi. Both sexes are easily separated from the other known species by having the parafacials and cheeks silvery instead of golden-brown, and the subepaulet black instead of orange-yellow.

I have no hesitation in stating the synonymy of *Dejeania podicaria* Rondani. Fortunately the latter's description emphasized the very characteristics upon which *Eudejeania melanax* is here recognized as distinct, namely, the silvery face and cheeks, legs black but with the base of each tarsus yellow, and the tibiae and tarsi silvery-haired. Most important of all, Rondani noted that the third antennal segment was "pediforme" and presented a figure showing it greatly expanded basally, in profile shaped like a foot. Walker gave no figure of the antenna of *melanax*, but his detailed description of the shape of the third segment leaves no doubt that he had a specimen with this type of antenna.

Engel listed *melanax* as a synonym of *pallipes* on the authority of Austen. He referred Rondani's species to *Eudejeania*, but made no further mention of it in his revision and apparently did not recognize it in the material before him. It would have run in his key to *pallipes* var. *argyropus*.

Material examined, 21 specimens: COLOMBIA: 2 males, 13 females, Bogotá (B. Guevara); female, Meta District, 1932 (B. Guevara) [U.S.N.M.]; male, 2 females, Monserrate, Bogotá, 2,700–3,000 m., June 24, 1939 (♀), and May 2, 1940 (H. Osorno) [Inst. Cien. Nat.]. ECUADOR: male, Baños, Oriente, 8–10,000 feet, January 4, 1923 (F. X. Williams) [U.S.N.M.]. VENEZUELA: male, Mérida (S. Briceno) (labeled *pallipes*, det. Townsend) [U.S.N.M.].

EUDEJEANIA PSEUDOPYRRHOPODA (Blanchard), new combination

Eudejeaniops pseudopyrrhopoda BLANCHARD, La Plata Mus. Rev., new ser., vol. 2, p. 353, 1941 (Argentina.)

According to the description, this species has entirely black body, white pruinose parafacials and cheeks, black palpi, black femora and tibiae, whitish yellow tarsi, black tibial bristles, abundant silvery-white hair on the tibiae and tarsi, black subepaulet (basicosta), and large size (19 mm.).

Of the species before me, this combination of characters applies only to *melanax* Walker. Blanchard's two specimens were females, and it is therefore not possible to say whether the males of *pseudopyrrhopoda* also have the same broad third antennal segment to be found in the males of *melanax*.

Because of the considerable difference in known distribution, I hesitate to suggest that *pseudopyrrhopoda* is a synonym of *melanax* Walker. It is certainly very close, however, and on the basis of

description alone I can find no means of distinguishing them. The status of the former will have to await study of further material, especially of male specimens, from Argentina.

10. *EUDEJEANIA NUDITIBIA*, new species

A species of the group with silvery hairs on the tibiae and tarsi, differing from all other known species by the absence of anterodorsal bristles on the hind tibia.

Male, female.—Typical habitus and structure of *Eudejeania*, specifically characterized as follows: Head predominantly yellow, the frontal stripe black, parafrontals brown, face whitish, epistoma deep brown, parafacials, cheeks, and occiput smoky golden; occipital hairs yellow above, whitish below; palpi black; antennae black, sometimes the second segment slightly reddish at the extreme apex, the third segment of the male not broadened at the base; width of the front at the vertex in the male approximately one-third the width of the head (0.33); female with proclinate frontoorbital bristles (2 pairs in the holotype, 1 pair in each of the female paratypes).

Body black in ground color, the thorax brown-pollinose above and gray on the sides; no acrostichal bristles, and 2 or 3 pairs of pre-sutural and one of postsutural dorsocentral bristles, at least in the type series.

Wings brown, the veins reddish; subepaulet (basicosta) orange.

Legs: Femora and tibiae black, the tarsi bright yellow, pulvilli sometimes brown; tibiae and tarsi covered with silvery white, appressed hairs, which are especially dense on the tibiae and conceal the ground color except in certain aspects; femoral bristles and hairs and the tibial bristles black, tarsal bristles yellow, and claws yellow with black tips; hind tibia without anterodorsal or other bristles except at the extreme apex.

Length of body (exclusive of spines), 15–16 mm. (Ecuador female only 13 mm.)

Type.—Female, U.S.N.M. No. 58280.

Holotype, female, Usaquén, Cundinamarca, Colombia, 2,700–3,000 m., October 3, 1939 (H. Osorno). Allotype, Bogotá (B. Guevara). Paratypes: female, Baños, Oriente, Ecuador, 8–10,000 feet, January 4, 1923 (F. X. Williams); female, Venezuela, 1923 (De Ballard). Type series in the United States National Museum.

11. *EUDEJEANIA ANDEANA*, new species

Similar to *nuditibia* and *argyropus*, differing from the former in having anterodorsal bristles on the hind tibia, and from the latter by bright yellow tarsi.

Female.—With the typical habitus and structure of *Eudejeania*, agreeing with the description of *E. nuditibia* in all particulars except the following: Thorax dark brown-black, virtually concolorous with the abdomen; three pairs of presutural and two of postsutural dorso-central bristles, though these figures are probably not significant in view of the known variation in the group; subepaulet dark orange to brown; silvery hairs on the tibiae not as dense as in *nuditibia* and other species, the ground color easily seen; hind tibia with four anterodorsal bristles, the distal bristle strong, the others progressively weaker toward the base of the tibia.

Type.—Female, U.S.N.M. No. 58281.

Holotype, female, "Cuesta von Cillutincara," Bolivia, 3,000–3,200 m. (Fassl). Paratype, female, Mérida, Venezuela (S. Briceno). Both in the United States National Museum.

This species equals *pallipes* in the sense of Engel, at least in part. The holotype was determined as *pallipes* by Engel himself, and was the specimen cited by Engel (1920, p. 288).

KEY TO THE SPECIES OF EUDEJEANIA⁶

1. Tibiae and tarsi with yellow to reddish-yellow hairs, tibial bristles concolorous except in *pyrrhopoda* and *birabeni*, which have black bristles; legs entirely reddish yellow except in *birabeni*, which has black femora; hind tibia with a row of 8–10 anterodorsal bristles of varying lengths; dorsal (extensor) surface of hind tibia, between anterodorsal and posterodorsal rows, glabrous except for a few pale hairs toward base, sometimes with a row or two of pale hairs extending about halfway to apex of tibia----- 2
- Tibiae and tarsi with silvery-white hairs, those on tibiae usually dense and concealing ground color; tibial bristles black; femora and tibiae black, except in *pallipes*; hind tibia typically with three anterodorsal bristles, basal one weak, occasionally with two or four bristles, or with none (*nuditibia*); dorsal surface of hind tibia usually entirely concealed by silvery hairs, with at least two complete rows----- 7
2. Palpi black or dark brown-black----- 4
- Palpi bright orange to orange-yellow; body entirely black; width of male front at vertex over one-third width of head (0.34–0.36)----- 3
3. Wings entirely brown; first and second antennal segments brown, the latter narrowly orange at apex; large species, body length 16–17 mm.
1. *nigra* Townsend
- Wing membrane brown but veins yellow, imparting to wing a characteristically yellow appearance toward base where veins converge; first and second antennal segments bright reddish yellow; smaller species, body length rather consistently about 14 mm----- 2. *punensis* Townsend
4. Bristles of tibiae reddish yellow, concolorous with hairs (rarely an individual bristle black)----- 5
- Bristles of the tibiae black; body black----- 3. *pyrrhopoda* Engel
birabeni (Blanchard)

⁶ For species that have been placed in *Eudejeania* but are not included in the key, see the discussions under *pallida* Robineau-Desvoidy, *mexicana* Robineau-Desvoidy, *montana* Van der Wulp, and *atrata* Van der Wulp.

5. Abdomen blood red to dark reddish brown; width of male front at vertex one-third or more width of head (0.33-0.39)----- 6
 Abdomen black; at vertex male front noticeably narrower than in any of the other species (holotype, 0.28 head width)-----4. *huascarayana* Townsend
6. Abdomen blood red; thorax reddish brown, disk of mesonotum dull gray-black; female without proclinate fronto-orbital bristles.

5. *subalpina* Townsend

Abdomen dark reddish brown, appearing to naked eye little different from black species; thorax black; female with 1 or 2 pairs of proclinate fronto-orbitals-----6. *aldrichi*, new species

(Tibiae and tarsi with silvery hairs)

7. Legs entirely black in ground color; parafacials and cheeks of smoky golden color; silvery hair on tibiae quite dense-----7. *argyropus* (Schiner)
 Legs with at least metatarsi yellow in ground color----- 8
8. Femora and tibiae entirely black in ground color; silvery hair on tibiae dense and closely appressed, concealing the ground color from direct view----- 9
 Legs predominantly yellow to orange in ground color, femora somewhat darker and infuscated toward base; tibiae not so thickly covered with silvery hair, ground color quite evident-----8. *pallipes* (Macquart)
9. Parafacials and cheeks smoky golden; tarsi entirely yellow; third antennal segment of male only slightly broadened at base, if at all----- 10
 Parafacials and cheeks predominantly silvery white; tarsi more or less infuscated apically, but at least the basal segment yellow; third antennal segment of male strongly broadened dorsally at base--9. *melanax* (Walker)

(The male of *pseudopyrrhopoda* Blanchard is unknown, but the female will come to this point in the key.)

10. Hind tibia without bristles except at extreme apex.

10. *nuditibia*, new species

Hind tibia with four slender but distinct anterodorsal bristles.

11. *andeana*, new species

SPECIES OF UNCERTAIN STATUS OR TRANSFERRED ELSEWHERE

EUDEJEANIA PALLIDA (Robineau-Desvoidy)

Dejeania pallida ROBINEAU-DESVOIDY, Diptères des environs de Paris, vol. 1, p. 653, 1863 (Mexico).

Eudejeania pallida (Robineau-Desvoidy) ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, p. 291, 1920.

Eudejeania pallida (Robineau-Desvoidy) TOWNSEND, Rev. Ent., vol. 1, p. 163, 1931.

Townsend reported that the type was lost, but he doubted that Engel was correct in determining material from the high Andes under a name proposed for a Mexican species. All that can be said from the description is that the abdomen was reddish brown and the legs reddish. Engel stated that the typical form of *pallida* had the tibiae covered with appressed, silvery-white hair, but inasmuch as that appearance is so striking, it scarcely seems credible that Robineau-Desvoidy would have failed to mention it had his specimens been so ornamented. *E. pallida* of Engel belongs in the group of species with *pallipes* Macquart, *argyropus* Schiner, *et al.*, whereas it appears probable that *pallida*

Robineau-Desvoidy *sensu stricto*, was similar to *E. subalpina* Townsend. I agree with Townsend, however, that it is unlikely that the latter two are synonymous. It is possible that *pallida* might be recognized if adequate Mexican material could be studied, but I cannot associate the name with any of the South American specimens before me.

EUDEJEANIA MEXICANA (Robineau-Desvoidy)

Dejeania mexicana ROBINEAU-DESVOIDY, Diptères des environs de Paris, vol. 1, p. 652, 1863 (Mexico).

Eudejeania mexicana (Robineau-Desvoidy) TOWNSEND, 1931, Rev. Ent., vol. 1, p. 163, 1931. Generic reference; type lost.

Townsend referred the species to *Eudejeania*, linking it with *pallida* as one of the species with brownish-red abdomen. I am unable to recognize it from the description, or to associate it with any of the species before me.

(?) EUDEJEANIA ATRATA (Van der Wulp)

Dejeania atrata VAN DER WULP, Biologia Centrali-Americana, Diptera, vol. 2, p. 8, pl. 1, fig. 2, 1903 (Costa Rica).

Eudejeania atrata (Van der Wulp) ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, p. 279, 1920.

Eudejeania atrata (Van der Wulp) TOWNSEND, Rev. Ent., vol. 1, p. 163, 1931. "Apparently distinct from *pallida* R.-D."

It seems to me quite probable that this species is not a true *Eudejeania*, or, if it should prove to belong, it must be very different from the known species, according to the description. The abdomen was said to be "cordiform," whereas *Eudejeania* has the abdomen subquadrate, with the apex quite broad and more or less emarginate on the midline. Van der Wulp also stated that his species had the "claws entirely black," whereas in all the species of *Eudejeania* known to me the claws are bright yellow with only the slender apical fourth to third of each claw black. As a further difference from any of the species except *argyropus*, it may be noted that Van der Wulp said the legs were "totally black," but he made no mention of the silvery-white hairs on the tibiae and tarsi that are so characteristic a feature of *argyropus*, and for that matter of all the other species of *Eudejeania* which have both femora and tibiae black. From the detail of Van der Wulp's descriptions of color, we may safely assume that he would have mentioned the presence of such hairs had they occurred on his material.

PROTODEJEANIA ECHINATA (Thomson)

Jurinea echinata THOMSON, Eugenes Resa, Diptera, p. 516, 1868 (California).

Dejeania montana VAN DER WULP, Tijdschr. Ent., vol. 35, p. 190, 1892 (Mexico). New synonym.

? *Eudejeania montana* (Van der Wulp) ENGEL, Zool. Jahrb., Abt. Syst., vol. 43, p. 279, 1920. Generic reference with a question.

Dr. Aldrich had noted in his card catalog at the United States National Museum that *montana* was a synonym of *Protodejeania echinata* (Thomson), from two cotypes of *D. montana* sent by the British Museum and now in the Museum at Washington. The cotypes run directly to *Protodejeania* in Townsend's "Manual of Myiology" (pt. 3, p. 179).

The synonymy suggested by Dr. Aldrich is accepted, and *montana* is eliminated from consideration under *Eudejeania*.